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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/535,304	01/17/2006	Beom-Seok Cho	21C-0296	3708
23413	7590	11/30/2006	EXAMINER	
CANTOR COLBURN, LLP 55 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002			CRUZ, LESLIE PILAR	
			ART UNIT	PAPER NUMBER
			2826	

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/535,304	Applicant(s) CHO ET AL.	
	Examiner Leslie P. Cruz	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
4a) Of the above claim(s) 6-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Minhloan Tran
Minhloan Tran
Primary Examiner
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Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>05/18/2005</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of Group I, drawn to a TFT substrate for an LCD apparatus, in the reply filed on November 03, 2006 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear if the "copper alloy layer" is a different layer than the "metal layer" or if they are the same.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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Claims 1, 4 and 5 are rejected under 35 U.S.C. 102(e) as being anticipated by Hu (US 2003/0001266 A1).

With respect to claim 1, Hu (e.g. Figs. 1A-1F) discloses a TFT substrate for an LCD apparatus comprising: a silicon-containing substrate [105]; a diffusion barrier layer [115] formed on the substrate; and a copper alloy layer formed on the diffusion barrier layer formed on the substrate; and a copper alloy layer [120] formed on the diffusion layer, the copper alloy layer including a material from about 0.5at% to about 15at%, which is used to form the diffusion barrier layer [paragraph 0026-0029].

With respect to claim 4, Hu discloses the TFT substrate of claim 1. Hu further discloses the copper alloy layer comprises a metal layer corresponding to a gate line, a source-drain electrode or a data line [132, paragraph 0004 and 0041].

With respect to claim 5, Hu discloses the TFT substrate of claim 1. Hu further discloses the silicon containing substrate is a silicon substrate, a glass substrate or a plastic substrate [paragraph 0022].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hu in view of Farrar (US 2002/0182858 A1).

With respect to claim 2, Hu discloses the TFT substrate of claim 1. Hu discloses that the diffusion barrier layer may be a titanium-containing material [0014]. Hu fails to specify that the diffusion barrier layer comprises a silicide compound including at least one selected from the group consisting of Zr, Ti, Hf, V, Ta, Ni, Cr, Nb, Co, Mn, Mo, W, Rh, Pd and Pt. However, paragraph 0038 of Farrar teaches that it is well-known for a diffusion barrier layer to comprise a silicide compound including at least one selected from the group consisting of Zr, Ti, Hf, V, Ta, Ni, Cr, Nb, Co, Mn, Mo, W, Rh, Pd and Pt. It is known in the art that a silicide compound including at least one selected from the group consisting of Zr, Ti, Hf, V, Ta, Ni, Cr, Nb, Co, Mn, Mo, W, Rh, Pd and Pt are beneficial because it improves heat resistance. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the diffusion barrier layer of Hu to comprise a silicide compound including at least one selected from the group consisting of Zr, Ti, Hf, V, Ta, Ni, Cr, Nb, Co, Mn, Mo, W, Rh, Pd and Pt as suggested by Farrar because it improves heat resistance as it is well known in the art.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hu in view of Krivokapic (US 6,888,198 B1).

With respect to claim 3, Hu discloses the TFT substrate of claim 1. Hu fails to specify that the thickness of the diffusion barrier layer is from about 50Å to about 5000Å. However, Krivokapic (e.g. Fig. 1) discloses that the thickness of the diffusion barrier layer [86] is from about 50Å to about 150Å [column 5 lines 14-18]. It is known in the art that the thickness of the diffusion barrier layer being from about 50Å to about 5000Å is beneficial because the thickness will properly ensure the diffusion barrier property of the diffusion barrier layer and substantially eliminate oxidation. Therefore, it would have been obvious to one of ordinary skill in the art at

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the time the invention was made for the diffusion barrier layer of Hu to have a thickness from about 50Å to about 5000Å to substantially eliminate oxidation as it is well known in the art.

Telephone/Fax Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leslie P. Cruz whose telephone number is (571) 272-8599. The examiner can normally be reached on Monday-Friday 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisors, Wael Fahmy and Robert Pascal can be reached on (571) 272-1705 and (571) 272-1769, respectively. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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